AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior listing of claims in this application.

1. (Previously presented) An optical recording medium comprising:

a transparent substrate;

a lower protective layer disposed above the transparent substrate;

a recording layer containing a phase-change material, disposed above the lower protective layer;

an upper protective layer disposed above the recording layer; and

an interfacial layer disposed at least one of between the recording layer and the lower protective layer and between the recording layer and the upper protective layer; and

a sulfuration-inhibiting layer formed over said upper protective layer;

a reflective layer disposed above the sulfuration-inhibiting layer;

an organic protective film layer formed over said reflective layer;

wherein the optical recording medium has a transition linear velocity ranging from 8 m/s to 11 m/s as determined by irradiating continuous light with a power of 11±1 mW and a wavelength of 660±10 nm using a pickup head with a numerical aperture (NA) of 0.65, and satisfies the following condition:

$\Delta R = |Rb-Ra| \leq 3\%$

where ΔR is an absolute value of the difference between Ra and Rb; Rb is a reflectance of an unrecorded area, and Ra is a reflectance of the top of an eye pattern after ten cycles of recording, and

wherein the optical recording medium is recordable with at least two recording modes of a first recording mode and a second recording mode, in which the first recording mode is that the optical recording medium is rotated at a constant angular velocity so as to have a linear velocity of 3 m/s to 4 m/s when recording on an innermost track of the optical recording medium and to have a linear velocity of 8 m/s to 9 m/s when recording on an outermost track of the optical recording medium, and the second recording mode is that the optical recording medium is rotated at a constant angular velocity so as to have a linear velocity of 5 m/s to 6 m/s when recording on an innermost track of the optical recording medium and to have a linear velocity of 13 m/s to 14 m/s when recording on an outermost track of the optical recording medium, and

wherein a wobbled groove is formed on the transparent substrate, the wobbled groove having a track pitch of 0.74±0.03 μm, a groove depth of 22 nm to 40 nm, and a groove width of 0.17 μm to 0.30 μm, the lower protective layer contains a mixture of ZnS and SiO_2, the phase-change material in the recording layer contains Sb and Te (as main components), the upper protective layer contains a mixture of ZnS and SiO_2, the sulfuration-inhibiting layer contains at least one of Si and SiC, and the reflective layer contains at least one of Ag and Ag alloy.

2. (Canceled).

3. (Original) An optical recording medium according to claim 1, wherein the lower protective layer has a thickness of 40 nm to 220 nm.

4. (Original) An optical recording medium according to claim 1, wherein the upper protective layer has a thickness of 2 nm to 20 nm.

5. (Original) An optical recording medium according to claim 1,

wherein the phase-change material in the recording layer has an atomic ratio [Sb/(Sb+Te)] of Sb to the total of Sb and Te of 0.74 to 0.85,

wherein the phase-change material further contains at least one of Ag, In, and Ge,

wherein the atomic ratio of the total of Ag, In, and Ge to the total atoms in the phase-change material is 0.04 to 0.10, and

wherein the atomic ratios of Ag, In, and Ge to the total atoms in the phase-change material satisfy the following conditions:

$0 \leq Ag \leq 0.01$, $0.02 \leq In \leq 0.06$, and $0.02 \leq Ge \leq 0.06$.

6. (Original) An optical recording medium according to claim 1,

wherein the phase-change material in the recording

layer has an atomic ratio [Sb/(Sb+Te)] of Sb to the total of Sb and Te of 0.74 to 0.79,

wherein the phase-change material further contains at least one of Ag, In, and Ge,

wherein the atomic ratio of the total of Ag, In, and Ge to the total atoms in the phase-change material is 0.04 to 0.10, and

wherein the atomic ratios of Ag, In, and Ge to the total atoms in the phase-change material satisfy the following conditions:

$0 \leq Ag \leq 0.01$, $0.02 \leq In \leq 0.06$, and $0.02 \leq Ge \leq 0.06$.

7. (Original) An optical recording medium according to claim 1,

wherein the phase-change material in the recording layer further contains at least one of Ag, In, and Ge,

wherein the phase-change material has an atomic composition satisfying the following conditions;

$0 \leq Ag \leq 0.015$, $0.010 \leq In \leq 0.080$, $0.600 \leq Sb \leq 0.800$, $0.100 \leq Te \leq 0.300$, and $0.010 \leq Ge \leq 0.080$, wherein the atomic ratio of the total of Ag, In, and

Ge to the total atoms in the phase-change material is from 0.050 to 0.090, and wherein the atomic ratio [Ag/(Ag+In+Ge)] of Ag to the total of Ag, In, and Ge in the phase-change material is 0.10 or less.

8. (Original) An optical recording medium according to claim 1, wherein the optical recording medium satisfies the following condition:

$3.5 < [Rmaxv-RCv] < 5$

where RCv is a recrystallization critical velocity (m/s) of the recording layer; and Rmaxv is a maximum recording linear velocity (m/s) of the recording layer.

9. (Original) An optical recording medium according to claim 1, wherein the recording layer has a thickness of 2 nm to 22 nm.

10. (Previously presented) An optical recording medium according to claim 2, wherein the reflective layer has a thickness of 90 nm to 200 nm.

Claims 11-12 (Canceled).

13. (Original) An optical recording medium according to claim 1, wherein the interfacial layer contains at least one oxide selected from ZrO_2, TiO_2, SiO_2, Al_2O_3, and Ta_2O_5.

14. (Canceled).

15. (Previously presented) An optical recording medium according to claim 22, wherein the at least one selected from rare-earth metal oxides and oxides of Group IIa elements of the Periodic Table of Elements except Be and Ra is contained in an amount of 1 mol % to 10 mol % relative to ZrO_2.

16. (Original) An optical recording medium according to claim 13, wherein TiO_2 is contained in the interfacial layer in an amount of 10 mol % to 50 mol % of the total oxides.

17. (Currently amended) An optical recording medium according to claim [[14]] 13, wherein TiO_2 is contained in the interfacial layer in an amount of 10 mol % to 50 mol % of the total oxides.

18. (Original) An optical recording medium according to claim 1, wherein the interfacial layer has a thickness of 1 nm to 22 nm.

19. (Previously presented) An optical recording medium comprising:

a transparent substrate;

a lower protective layer disposed above the transparent substrate;

a recording layer containing a phase-change material, disposed above the lower protective layer;

an upper protective layer disposed above the recording layer;

an interfacial layer disposed at least one of between the recording layer and the lower protective layer and between the recording layer and the upper protective layer,

a sulfuration-inhibiting layer disposed above the upper protective layer; and

a reflective layer disposed above the sulfuration-inhibiting layer,

wherein a wobbled groove is formed on the transparent substrate, the wobbled groove having a track pitch of 0.74±0.03 μm, a groove depth of 22 nm to 40 nm, and a groove width of 0.17 μm to 0.30 μm, the lower protective layer contains a mixture of ZnS and SiO_2, the phase-change material in the recording layer contains Sb and Te (as main components), the upper protective layer contains a mixture of ZnS and SiO_2, the sulfuration-inhibiting layer contains at least one of Si and SiC, and the reflective layer contains at least one of Ag and Ag alloy.

20. (Previously presented) An optical recording medium comprising:

a transparent substrate;

a lower protective layer disposed above the transparent substrate;

a recording layer containing a phase-change material, disposed above the lower protective layer;

an upper protective layer disposed above the recording layer;

an interfacial layer disposed at least one of between the recording layer and the lower protective layer and between the recording layer and the upper protective layer,

a sulfuration-inhibiting layer having a thickness of 3 nm to 22 nm;

wherein the optical recording medium has a transition linear velocity ranging from 8 m/s to 11 m/s as determined by irradiating continuous light with a power of 11±1 mW and a wavelength of 660±10 nm using a pickup head with a numerical aperture (NA) of 0.65, and satisfies the following condition:

$$\Delta R = |Rb-Ra| \leq 3\%$$

where ΔR is an absolute value of the difference between Ra and Rb; Rb is a reflectance of an unrecorded area, and Ra is a reflectance of the top of an eye pattern after ten cycles of recording, and

wherein the optical recording medium is recordable with at least two recording modes of a first recording mode and a second recording mode, in which the first recording mode is that the optical recording medium is rotated at a constant angular velocity so as to have a linear velocity of 3 m/s to 4 m/s when recording on an innermost track of the optical recording medium and to have a linear velocity of 8 m/s to 9 m/s when recording on an outermost track of the optical recording medium, and the second recording mode is that the optical recording medium is rotated at a constant

angular velocity so as to have a linear velocity of 5 m/s to 6 m/s when recording on an innermost track of the optical recording medium and to have a linear velocity of 13 m/s to 14 m/s when recording on an outermost track of the optical recording medium.

21. (Previously presented) An optical recording medium comprising:

a transparent substrate;

a lower protective layer disposed above the transparent substrate;

a recording layer containing a phase-change material, disposed above the lower protective layer;

an upper protective layer disposed above the recording layer;

an interfacial layer disposed at least one of between the recording layer and the lower protective layer and between the recording layer and the upper protective layer,

a sulfuration-inhibiting layer comprising 90 mol% or more of Si and SiC disposed above said upper protective layer;

wherein the optical recording medium has a transition linear velocity ranging from 8 m/s to 11 m/s as determined by irradiating continuous light with a power of 11±1 mW and a wavelength of 660±10 nm using a pickup head with a numerical aperture (NA) of 0.65, and satisfies the following condition:

$$\Delta R = |Rb-Ra| \leq 3\%$$

where ΔR is an absolute value of the difference between Ra and Rb; Rb is a reflectance of an unrecorded area, and Ra is a reflectance of the top of an eye pattern after ten cycles of recording, and

wherein the optical recording medium is recordable with at least two recording modes of a first recording mode and a second recording mode, in which the first recording mode is that the optical recording medium is rotated at a constant angular velocity so as to have a linear velocity of 3 m/s to 4 m/s when recording on an innermost track of the optical recording medium and to have a linear velocity of 8 m/s to 9 m/s when recording on an outermost track of the optical recording medium, and the second recording mode is that the optical recording medium is rotated at a constant angular velocity so as to have a linear velocity of 5 m/s to 6 m/s when recording on an innermost track of the optical recording medium and to have a linear velocity of 13 m/s to 14 m/s when recording on an outermost track of the optical recording medium.

22. (Previously presented) An optical recording medium comprising:

a transparent substrate;

a lower protective layer disposed above the transparent substrate;

a recording layer containing a phase-change material, disposed above the lower protective layer;

an upper protective layer disposed above the recording layer;

an interfacial layer disposed at least one of between the recording layer and the lower protective layer and between the recording layer and the upper protective layer, wherein the interfacial layer contains ZrO_2, TiO_2, and at least one selected from

rare-earth metal oxides and oxides of Group IIa elements of the Periodic Table of Elements except Be and Ra,

wherein the optical recording medium has a transition linear velocity ranging from 8 m/s to 11 m/s as determined by irradiating continuous light with a power of 11±1 mW and a wavelength of 660±10 nm using a pickup head with a numerical aperture (NA) of 0.65, and satisfies the following condition:

$$\Delta R = |Rb-Ra| \leq 3\%$$

where ΔR is an absolute value of the difference between Ra and Rb; Rb is a reflectance of an unrecorded area, and Ra is a reflectance of the top of an eye pattern after ten cycles of recording, and

wherein the optical recording medium is recordable with at least two recording modes of a first recording mode and a second recording mode, in which the first recording mode is that the optical recording medium is rotated at a constant angular velocity so as to have a linear velocity of 3 m/s to 4 m/s when recording on an innermost track of the optical recording medium and to have a linear velocity of 8 m/s to 9 m/s when recording on an outermost track of the optical recording medium, and the second recording mode is that the optical recording medium is rotated at a constant angular velocity so as to have a linear velocity of 5 m/s to 6 m/s when recording on an innermost track of the optical recording medium and to have a linear velocity of 13 m/s to 14 m/s when recording on an outermost track of the optical recording medium.

23. (Currently amended) An optical recording medium comprising:

a transparent substrate;

a lower protective layer formed over the transparent substrate;

a recording layer formed over the lower protective layer;

an upper protective layer formed over the recording layer; [[and]]

a sulfuration-inhibiting layer formed over the upper protective layer having a thickness of 3 nm to 22 nm; and

an interfacial layer formed over the lower protective layer.

24. (Previously presented) The optical recording medium according to claim 23, further comprising a reflective layer formed over the sulfuration-inhibiting layer.

25. (Canceled).

26. (Currently amended) The optical recording medium according to claim [[25]] 23, further comprising a second interfacial layer formed over the upper protective layer.

27. (Previously presented) The optical recording medium according to claim 23, further comprising an interfacial layer formed over the upper protective layer.

28. (Previously presented) An optical recording medium comprising:

a transparent substrate;

a lower protective layer formed over the transparent substrate;

a recording layer formed over the lower protective layer;

an upper protective layer formed over the recording layer;

a sulfuration-inhibiting layer comprising 90 mol% or more of Si and SiC formed over the upper protective layer;

a reflective layer formed over the sulfuration-inhibiting layer; [[and]]

an organic protective film layer formed over the reflective layer; and

an interfacial layer formed over the lower protective layer.

29. (Canceled).

30. (Currently amended) The optical recording medium according to claim [[29]] 28, further comprising a second interfacial layer formed over the upper protective layer.

31. (Previously presented) The optical recording medium according to claim 28, further comprising an interfacial layer formed over the upper protective layer.

32. (Canceled).